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LETTER AND COMMENTS FROM MISSOURI DEPARTMENT OF HEALTH AND SENIOR
SERVICES REGARDING DRAFT FIVE-YEAR REVIEW REPORT SITES SS-03 AND SS-09
MCRCO KANSAS CITY MO (PUBLIC DOCUMENT)
8/30/2012
MISSOURI DEPARTMENT OF HEALTH AND SENIOR SERVICES



Missouri Department of Health and Senior Services

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August 30, 2012

Jim Harris, Project Manager
Federal Facilities Section, DoD Unit
Hazardous Waste Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO. 65102-0176

Re: Department of Health and Senior Services comments on the document *Draft Final Five-Year Review Report, Sites SS-003 and SS-009, Former Richards-Gebaur Air Force Base, Kansas City, MO*; June 2012.

Dear Mr. Harris:

The Department of Health and Senior Services (DHSS) received your request to review and comment on the referenced document. DHSS comments are provided below.

1. Section 3.3, *Site Conceptual Model*, page 15 indicates no contact with groundwater (dermal and ingestion) for current and future scenarios due to the lack of potable water use. For a construction worker, direct contact with shallow perched groundwater including incidental ingestion, dermal contact, and inhalation pathways are potentially complete. Given these pathways are complete; a description of risk should be discussed and/or calculated for both current and future exposures for the construction worker.
2. Section 5.2, *Exposure Assumptions, Toxicity Data, Cleanup Levels, Remedial Action Objectives Validity*, does not provide toxicity data or cleanup levels for the inhalation pathway. DHSS recommends that the document be revised accordingly.
3. For Section 5.3.1, *Vapor Intrusion Evaluation*, and ensuing Sections 5.3.2, *Vapor Intrusion Conceptual Site Model Site SS-003*, and Section 5.3.3, *Vapor Intrusion Conceptual Site Model Site SS-009*, depth to perched groundwater, depth of the screening (or depth to bedrock in general), and results of nested sampling (if available) should be provided. This will help determine whether a future basement scenario is feasible, if contaminated groundwater will potentially encroach into buildings with basements, and how to assess the vapor intrusion to indoor air pathway (VI). If basement foundations will reside within a perched water table that exists year-round, then the value of modeling is questionable. Also in question is the concentration to use for modeling. If non-detects (ND) are the rule in shallow groundwater, and soil contamination of VOCs in the domain are ND for trichloroethylene (TCE), VI may be incomplete.

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4. According to Section 5.3.2, Building P704 has a piping chase that routinely accepts groundwater seepage. It is imperative that this groundwater be sampled, so that impacts to indoor air may be assessed directly from this source. Attenuation estimates differs for seepage into the building versus that of VI from sublab sources. Estimation of indoor air concentrations will then be diffusion only assuming the Henry's constant, groundwater concentration, volume of air, and air exchange rate. Advective forces do not apply in this assessment.
5. From Section 5.3.2, *Vapor Intrusion Conceptual Site Model Site SS-003*, it appears that the nature of the activities performed in building P704, vehicle maintenance, may lead to a highly-exposed population for exposure to TCE. TCE is still a commonly-used degreasing agent for automotive applications. Automotive fuels will be another source of indoor air vapors.

DHSS has reviewed the interaction profiles provided by the Agency for Toxic Substance and Disease Control for TCE and other chemicals. It appears there are no profiles for automotive fuels and TCE, only jet fuel and TCE (see Draft *Interaction Profile for Arsenic, Hydrazines, Jet Fuels, Strontium, and Trichloroethylene*; Department of Health and Human Services, Agency for Toxic Substances and Disease Registry; December 2001). For cancer, no significant increase in incidence is noted. For non-cancer, endpoints are similar (neurological, hepatic, and immunological effects).

Given no information is available on what chemicals are used at the site, nor indoor air data available, a qualitative statement of the potential for an effect at minimum is warranted.

Whether definitively a high-risk population is identifiable cannot be made at this time. In lieu of the lack of data, minimizing exposure to additional sources of TCE from operations may be justifiable.

6. For Section 5.3.4, *VI Evaluation*, DHSS assessed VI for building 5605 using the Environmental Protection Agency (EPA) Vapor Intrusion Screening Level (VISL) calculator assuming commercial occupation. Under commercial exposure assumptions, TCE and tetrachloroethylene (PCE) concentrations presented on Figure 5-4, *SS 009 COCs Exceeding RACGs*, do not present excess risk assuming both single chemical and additive risk. However, under residential assumptions, non-cancer risk is exceeded for TCE (a hazard quotient of 1.9).

Because of the exceedance of non-carcinogenic risk under a residential exposure scenario, future land use should be limited to exposure scenarios that reflect commercial exposure assumptions. For example, assuming that Building 5605 will continue to be a leasable facility, future leases should exclude exposure that significantly deviate from commercial exposure assumptions (e.g. adult workers, assuming 8 hours per day for 250 working days per year), or that may include susceptible populations (i.e. daycares and residential care facilities). DHSS' comment 12 and the potential for teratogenic effects (see below) specifically addresses the concern relating to children and TCE. Please acknowledge the need to limit leases as noted above.

7. For Figure 5-3, *SS-009 Conceptual Site Model*, why has PCE been excluded from the conceptual site model? Please provide the detected concentrations and locations of PCE in the aerial view.

8. According to Section 5.3.3, *Vapor Intrusion Conceptual Site Model SS-09, Building SS-605*, Metro Community College is housed in a portion of this building. Please identify any activity that may violate toxicity assumptions that include only adults (e.g. daycare). If humans having ages from infancy through 16 years occupy this building, then exposure assumptions as well as mutagenic effects from exposure to TCE and adjustment to toxicity for vinyl chloride (VC) for early life exposures must be addressed.
9. For Section 5.3.4, *VI Evaluations*, the following applies:
 1. For Appendix I, *Vapor Intrusion Inputs*, which presents the EPA Johnson and Ettinger Model (JEM) for vapor intrusion results, please justify:
 1. Use of exposure duration of 8.333 years. Default for non carcinogenic is 25 years.
 2. Why a basement VI assessment was not performed as part of a future exposure scenario?
 3. Why the analysis utilizes 1.0E-05 as the cancer target level?
 4. Why PCE, within the plume under Building 5605 at 15.8 micrograms per liter (ug/L), was not assessed for VI as a chemical of concern?
 5. When running the same JEM groundwater-advanced (GW-ADV) version 3.1, and assuming a clay loam, DHSS obtained a soil bulk density of 1.48 grams per centimeter cubed (g/cm^3) (versus 1.50 in the Appendix I outputs), total porosity of 0.442 (versus 0.430 in the output), and a soil water-filled porosity of 0.168 centimeter cubed per centimeter cubed (cm^3/cm^3) (versus 0.3 in the output). This results in a change of indoor air concentrations from 1.99E-02 to 4.16E-02 ug/m^3 . Please identify the source of this discrepancy.
 2. The inhalation unit risk factor incorrectly noted as 1.4E-06 per microgram per meter cubed ($(\text{ug}/\text{m}^3)^{-1}$) should be 4.1E-06 (ug/m^3)⁻¹. Note that the JEM model outputs in Appendix I had already been updated correctly.
10. According to Section 5.3.2, building P704 has an open pit that “has been noted to fill with (ground) water”. Groundwater flow direction is southeast, and TCE is detected on both the northwest and southeast of the building, so that the highest detected concentrations within the plume flow beneath the building. DHSS suggests that the influx of groundwater be remedied.
11. For Appendix E, DHSS recommends that the Theil-Sen slope be performed on the data. This is a non-parametric alternative to linear regression which can be used in conjunction with the Mann-Kendall test to determine how steeply the concentration levels are increasing over time for a significant trend. EPA’s software ProUCL Version 4.1.0 has been enhanced to perform this test.

12. Within Table 5-3, *Richards-Gebaur AFB Sites SS-003 and SS-009 Vapor Intrusion Risk Summary Results for TCE, Johnson and Ettinger Model V3.1 2004*, residential risk cannot be calculated using the JEM for TCE nor VC. VISL may be used to calculate the risk. For toxicity assessment for TCE, please ensure that residential risk calculations consider mutagenic effects to include the kidney cancer endpoint of $1.0\text{E-}06 \text{ (ug/m}^3\text{)}^{-1}$ (adjusting intake using the age dependent adjustment factors), and $3.10\text{E-}06 \text{ (ug/m}^3\text{)}^{-1}$ for the non-Hodgkin lymphoma and liver cancer endpoints, with the results added together. For VC, VISL will estimate risk using the early-life and later-life carcinogenic risk components. VISL is available on line at <http://www.epa.gov/oswer/vaporintrusion/guidance.html#Item2>.

Aside from the document-specific comments provided above, an issue related to the technical assessment of toxicity needs to be addressed. DHSS notes that a new toxicity value for TCE may be available in the future. Currently EPA is assessing the potential for teratogenicity in a sub chronic exposure scenario. This is an issue which may affect future protectiveness of the remedy for these sites. As this is currently under review by EPA, DHSS recommends as part of this 5 year review that an update be provided as an annual task. If EPA establishes a new toxicity value, cleanup goals and risk should be reevaluated. This may result in more stringent cleanup goals being established for these sites, and require a re-evaluation of the protectiveness of the remedy.

Thank you for the opportunity to comment. If you have any questions regarding these comments, please contact Andrew McKinney at (573) 751-6102.

Sincerely,



Jonathan Garoutte, Chief
Bureau of Environmental Epidemiology

JG/ALM/mp

cc: Rubin Zamarrippa